

## Nitrogen mineralization rates in forest soils in Japanese archipelago - Soil chemical properties -

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### 1.Introduction

The nitrogen (N) dynamics in forest soils in the Japanese archipelago varies widely because it extends for 3000 km and the climatic zone ranges from cool-temperate to subtropical region. Also, changes in N dynamics due to the climate change are expected to differ from region to region. Therefore, it is necessary to understand the mechanisms and factors which control the biogeochemical responses to the environmental changes. In this study, we selected more than 30 sites from the Japanese archipelago and measured the soil N mineralization rates by field and laboratory incubation. Also, we measured the physical and chemical soil properties, and the relationships between such properties and N mineralization rates will provide a map of N mineralization rates in Japan. In this meeting, we will show the basic information of soils from 34 sites in regards to the chemical and physical properties.

### 2.Materials and methods

We established an experimental plot (20 \* 20 m) at each site, and at each plot, five soil sampling locations were established. At each sampling location, mineral soil samples were collected from 0-10, 10-30, 30-50 cm in depth. Soil pH(H<sub>2</sub>O) (fresh soil:water = 1:2.5) and water soluble cation (Ca<sup>2+</sup>, Mg<sup>2+</sup>, K<sup>+</sup>, Na<sup>+</sup>, NH<sub>4</sub><sup>+</sup>, Al<sup>3+</sup>), anion (Cl<sup>-</sup>, NO<sub>3</sub><sup>-</sup>, SO<sub>4</sub><sup>2-</sup>), and organic carbon (WSOC) were measured.

### 3.Results and discussion

pH(H<sub>2</sub>O) increased from the surface to deeper soil layers. The variation range was remarkably wide; the minimum value of 0-10 cm soil was 3.5 (Ashiu site) and the maximum value was 8.0 (Fuji-Hokuroku site), and the range became smaller in the deeper the soil layers. In contrast, the concentrations of water soluble NO<sub>3</sub><sup>-</sup> and Ca<sup>2+</sup> were high in the surface layer and decreased in the deeper layers. Concentrations of water soluble Cl<sup>-</sup> and Na<sup>+</sup> were significantly high in the site near the sea (Akita and Yona site).

The ion balance (total cation - total anion) was positive at almost all site, which indicated that the anion was in deficit. The positive correlation between the ion balance and WSOC suggested that the organic acid compensated the anion deficit. The slope between WSOC and the ion balance differed among sites, and the slope was higher in the site of low soil pH(H<sub>2</sub>O) suggesting that the organic acid was more dissolved in such sites. From the soil chemical properties, it indicated that the water soluble substrates interacted with soil pH(H<sub>2</sub>O).

Keywords: nitrogen mineralization rate, nitrification rate, forest soil, soil chemical properties, Japanese archipelago